“Scale Relative ontology” and Scientism: Must Every thing Go?

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Consider a quotation referred to by philosophers of science.² As I write this piece now–pencil and paper in hand–I am not concerned about the table upon which I am working. But I have another table (2), nearby. But whereas mine

[...] has extension; it is comparatively permanent; it is coloured; above all it is substantial [...]. Table No. 2 is my scientific table. (It) [...] is mostly emptiness. Sparsely scattered in that emptiness are numerous electric charges rushing about with great speed, but their combined bulk amounts to less than a billionth of the bulk of the table itself. Notwithstanding its strange construction it turns out to be an entirely efficient table. It supports my writing paper as satisfactorily as table No. 1; for when I lay the paper on it the little electric particles with their headlong speed keep on hitting the underside, so that the paper is maintained in shuttlecock fashion at a nearly steady level.

But the writer’s worry is

[...] whether the paper before me is poised as it were on a swarm of flies [...] or whether it is supported because there is substance below it, it being the intrinsic nature of substance to occupy space to the exclusion of other substance [...].

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Philosophica, 46, Lisboa, 2015, pp. 98-118.
Walter Benjamin drew attention to Eddington’s theoretical dilemma in forwarding the thesis that these remarks exhibited an alarming similarity to the time and content of Kafka’s writings. And that word ‘alarming’ can be cast in terms of Benjamin’s lesson in relation to Kafka’s text: reality for twenty first century characters like you and me is to be understood as what is realized “theoretically, in modern physics, and in practice by modern technology.” Eddington’s conclusion, of course, was that “I need not tell you that modern physics has by delicate test and remorseless logic assured me that my second scientific table is the only one which is really there.” Now was Eddington right? In response to such a question, Ladyman and Ross are to be credited with introducing the idea of “scale relativity ontology”. I will attempt to delineate this proposal, explicating a three dimensional nature for such an ontology, before examining how far it can sustain their claim for “the scientistic stance”. (ETMG 193 & 303).

Ontic Structural Realism

To elucidate this idea of ‘Scale Relative Ontology’ (SRO from now on), their idea of Ontic Structural Realism requires elucidation. But it is SRO which has played an important element for them in leading traditional metaphysicians to reconsider the ontological presuppositions of the sciences. So, despite giving credit to Eddington, they oppose his position arguing for a much more sophisticated form of naturalism – Ontic Structural Realism – which makes their claim on behalf of the scientistic attitude more persuasive. In fact, contemporary physics is unable to sustain the notion that what exists ultimately is to be understood in terms of little thing-like entities – whether atoms, electrons, particles, or whatever – whilst in addition rejecting the idea of “‘causal powers’ to fundamental aspects of reality”. As an alternative, the case for ‘real patterns’ is articulated. They argue that ‘to be is to be a real pattern’ since structures encode information, about some given entity or event, expressed through real patterns for an experimenter forwarding a scientific theory. For them a pattern can be

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5 For drawing attention to the idea of structure (cf. ETMG 145): “What sort of thing is it that I know? The answer is structure.” A.S. Eddington, *The Philosophy of Physical Science*: Cambridge UP, 1939, p. 147.
regarded as “just any relation among data.” (ETMG 193, 155 & 227-8).

Yet in economics, psychology or biology, the special sciences do employ notions such as material individuals, causes, and persons. But their objective is to bring physics into an overall union with the special sciences, so that metaphysics can be put on a proper footing, (ETMG 195 & 194): metaphysics has to be grounded in the attempt at unifying – through seriously regarding the achievements of contemporary science – the verified theories and hypotheses of the sciences according to what they call “the Principle of Naturalistic Closure” (PNC from now on) stated as:

Any new metaphysical claim that is to be taken seriously at time \( t \) should be motivated by, and only by, the service it would perform, if true, in showing how two or more specific scientific hypotheses, at least one of which is drawn from fundamental physics, jointly explain more than the sum of what is explained by the two hypotheses taken separately [...] subject to certain “terminological stipulations”. (ETMG 37) So for the special sciences any of their hypotheses that oppose fundamental physics are to be disregarded.

Given this conceptual framework, then, a clear aim can be articulated: the attempt “to determine the objective structures in nature”, cast, for physics at least, as ‘real patterns’ regarded as describing “a part of objective reality”. Such patterns encode information “[...] about a structure” so providing a means to advocate Ontic Structural Realism which seeks to synthesize a constructive sense of empiricism with scientific realism based upon a broad interpretation of the young Peirce’s verificationism thereby rendering a commitment to objective modal structures. (ETMG 36, 227 & 67) Here his treatment of ‘hardness’ is referred to in that if something of “a certain kind” is “exposed to an agency of a certain kind, a certain kind of sensible result” would be forthcoming in the light of experience. What can be established, then, is that a certain character – hardness – may be possessed by that something. So “a real Modality, including real Necessity and real Possibility” can be advocated. (CP 5.457) Moreover, regularities found in experience or mediated experience – ‘experience’ resulting through instrumentation – provide the grounds for referring to modal structures postulated to locate real patterns found within that experience, or ‘experience’, of the world subject to a condition: “When a real pattern is located relative to some structure that models patterns of the relevant

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kinds, enough parameters must be specified to distinguish it from other real patterns in the same domain.”

**Scale Relative Ontology**

We may now be able to appreciate the force of what drives the book *Every Thing Must Go*: “to take the conventional philosophical model of an individual as being equivalent to the model of an existent mistakes practical convenience for metaphysical generalization.” (italics in ETMG 229). Some special sciences will regard certain patterns as being individuals – as in the case say of economics or psychology – while others may not do so. The existence of our cat, cast as a species member, originates, historically, out of a process called Natural Selection, yet her particular actuality now as this particular, individual cat *Spooky* is not so dependent. It is one thing to track her individual biography, quite another to observe the effects of Natural Selection, the latter requiring a different scale of interpretation. Ladyman and Ross remark: “Such scale ascendance was Darwin’s greatest intellectual achievement.” And as far as tables are concerned, Eddington’s writing table “is probably a real pattern. Strictly speaking there is no scientific table at all because there is no single candidate aggregate of real microscopic patterns that is best suited to be the reductive base of the everyday table.” So we don’t need to speak of regarding Eddington’s writing table or any table for that matter as supervening or being reduced to genuine or ultimate real patterns that physics might offer. (OTMG 203 & 253) An adopted scale of interpretation depends on the cognitive interest we choose to employ, save for the fact that they would wish to speak rather of our scientific interest, if such a form of discourse was to be used. For them, then, there is no foundational level. Rather, in Ross’s words, “it’s real patterns all the way down”. As to claims made about what really exists in a mind-independent way, these have to be relativized to mind-independent “scales at which nature is measurable.” So at the quantum level,

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7 Consider the proposition “John spoke and was silent.” To claim that at one temporal moment a single subject John spoke and at another he was silent commits the spatialization of time fallacy, as elucidated by Bergson and Whitehead. Rather it is the actuality John-at-time-t¹ who spoke, not John, and another actuality John-at-time-t² who is silent. John regarded as an existent is an abstraction from what is concrete experience. “Whitehead and Ordinary Language,” *Whitehead’s Philosophy*, C. Hartshorne, Lincoln: Nebraska UP, 1972, pp. 171-82, 180.

it appears that *Spooky* simply does not exist anymore than Eddington’s ‘scientific’ table or you and I exist. Again, at a scale where Cosmology or Astrophysics is the interpretative discourse, *Spooky* does not exist anymore than do mountains. (OTMG 178, 228, 200 & 199).

For Ladyman and Ross, the forms of discourse and ways we invoke to delineate the means by which we “track the world” are dependent upon the cognitive scale employed to measure it. (OTMG 199) Here we have three possibilities: the contemplative or cosmological; the practical; the theoretical. Moreover, in twenty first, rather than nineteenth century terms, the distinctions offered by Schelling, Hegel and Peirce between the aesthetic, the practical and the theoretical have been transformed into the cosmological, the ‘middle-sized’ perspective and the scientific standpoint. We now need to ascertain how this can be so.

**The Cosmological or Contemplative Dimension**

Clearly Schelling defends this contemplative dimension in forwarding a cosmological perspective to ground his metaphysics. For him, as for Plato, the philosopher cannot present “the unconditional (*das Unbedingte*) by means of something conditional (*ein Bedingtes*)”.9 That Unconditional, Schelling calls the Absolute. It is any form of inquiry’s first assumption so that it becomes “the supreme presupposition of all knowledge, the first knowledge.” But although primordial knowledge “is originally present only in the absolute itself, it is also present in ourselves in the idea of the essence of all things and in the eternal idea of ourselves; and our total system of knowledge can be only a copy of that eternal knowledge”10 the latter being what should be the central concern of a University education: philosophy. Thereby philosophy is to be regarded as “the science of the absolute.”11 But how can human beings become aware of that Absolute? Only “what is *directly* given to us, without any mediation by concepts, or

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any consciousness of our freedom”: “by intuition and intuition is therefore the highest element in our knowledge.”12 And it is through intuition – an unconscious power – which can enable someone who is able to exercise this gift to identify him/herself with Natura Naturans, “the formative energy of the universe.”13

So a totality is posited, manifested in the endless producing of “individual things in time”, made possible by the divine seeds of Ideas fertilizing such a process. As the Absolute realizes its own self-identity, these Ideas are produced within “the eternal cognitive act”.14 But why this sense of ongoingness or in terms Heidegger popularized, ‘Why is there something rather than nothing?’ In his On the World Soul of 1798, Schelling claims that some kind of originary ‘Big Bang’ undid the universe’s original unity and as some new unified principle was initiated, finite entities became created.15

Now what would Ladyman and Ross make of all this? They might credit Schelling with realizing that at the cosmological or astrophysical scale of interpretation, what we take to exist, finite entities such as ourselves, ultimately fail to exist but they would reject any claim to the effect that they “aren’t real at all”. (ETMG 182) But, as Hegel claimed, they have little time for intuition, whether aesthetic or intellectual. They recognize the Platonic, even Cartesian, contribution to the rationalist tradition in stressing the importance of intuition, possibly acting as guides to the truth, but in 21st century terms, what may be regarded as intuitive can’t be innate but must rather be regarded as intricately involved in “development and educational achievement” thereby depending on ontogenetic, cognitive, and particular cultural learning factors. Intuitions may have helped too in overcoming our ancestors’ survival problems but can’t deal with complex inductive reasoning in relation to abstract domains required by scientific theorizing. (ETMG 10 & 28) Moreover, they would reject any attempt at metaphysical speculations16: instead they would advance Peirce’s sense of verificationism, the idea of existence being restricted “to patterns

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16 “As currently described, the very idea of naturalized metaphysics is subject to a debilitating vagueness which renders its advocates unable to articulate convincingly what it is that makes metaphysical theorizing acceptable in some domains and problematic in others.” A. Chakkavartty, “On the Prospects of Naturalized Metaphysics”, Scientific Metaphysics, D. Ross (et. al.) eds., Oxford UP, 2013, pp. 27-50, 30.
that support informational projection under some physically [...] possible perspective” rather than logically or mathematically possible perspectives as forwarded by a Platonist vision of reality. In addition, in the 21st century it is absurd to think that sitting in some deck-chair, or at whatever table, it is possible for a thinker all on his/her own to discover anything about the nature of existence that would “compete with the fruits of ingenious experimentation conducted under competitive pressure and organized by complex institutional processes.” As for theories about the ‘Big Bang’—Schelling’s or otherwise—it’s postulation is not a settled matter, but even if it were, within our universe there is no “physically possible perspective” yielding information on the other side of this singularity about what may have caused such an eventuality. (ETMG 234, 57 & 237)

**The ‘Middle-Sized’ Perspective**

Hegel is an example of a philosopher more concerned, firstly, with entities of a ‘middle sized’ proportion whilst, secondly, dismissing intuition: anything in immediate experience cannot be known through the given. Clearly, then, there is an opposition for him between the experiencing subject and an object since the latter represents subjectivity’s negation. So whilst what Hegel calls sense-certainty informs the experiencer of what is other than the self, it is impossible through sense-certainty to characterize what it is. Indeed this distinction represents his differentiation between “immediacy and mediation”: “But the object is [...] It is, regardless of whether it is known or not; and it remains, even if it is not known, whereas there is no knowledge if the object is not there.” (PS 93)


18 PS 93 refers to G.W.F. Hegel, Phenomenology of Spirit A.V. Miller (tr.) Oxford UP, 1977, par. 93.

specific conception of reality, forwarded within a particular culture, by “various cognitive and other domains” which prevail in some given historical, place or time.\(^\text{20}\)

A third difference is also crucial. Whereas Schelling, in Platonic fashion, bases his philosophy upon an awareness of the infinite and interprets the finite in terms of the latter, so that ontology grounds his epistemology, Hegel reverses that stance: his ontological claims emerge from his epistemology. Yet he is sceptical about the significance of experimentation, just as Schelling\(^\text{21}\) was, since Hegel believes the latter to be too much dependent upon analogy which “does not permit an inference to be made” and upon the idea of probability which contrasts with the truth. (PS 250) That ascent to truth is provided by a dialectic from the finite, ascending through a series of epistemologically necessary inferences initiated by means of a dialectical procedure through three stages, abstractions or moments [...] Consciousness, Self-consciousness and Reason – distinguishable from figures of consciousness constituting each one of them. So, through Hegel’s cognitive ascent, the necessity of inference leads to the discovery of Geist: Hegel claims his method “[...] was to begin with first and simplest appearance of mind, immediate consciousness, and to develop its dialectic up to the philosophical point of view, the necessity of that view being proved by the process.”\(^\text{22}\) But now in our descent to interpret finite reality, an ontological sense of necessity is invoked.\(^\text{23}\)

Now Ladyman and Ross consider the possibility that they “are instances of the Hegelian stance”. Indeed, they have to “own up to being materialist Hegelians”. They are so, firstly, not simply because they would endorse Hegel’s rejection of intuition but because they render pride of place to inquiry – epistemological claims lead towards ontological possibilities – cashing Peirce’s claim\(^\text{24}\) that “philosophy fashions its style of inquiry after the example of science.” Since they endorse “whatever physicists


\(^{21}\) “The experimenter discovers the natural order only in rare cases, when he happens to hit on it instinctively or is guided by a construction. And yet experimentation, which may disclose details but can never give a complete view, is still looked upon as the infallible principle of our knowledge of nature.” On University Studies, 129.


\(^{24}\) Peirce’s claim is that it “is above all the normative sciences, esthetics, ethics and logic, that men are in dire need of having severely criticized, in their relation to the new world created by science.” (CP 5.513).
endorse”, “so much for Hegel after all.” (ETMG 62, 63 & 62) But thereby their definition of physicalism does endorse Hegel’s insight which influenced Peirce so much.25 Hegel’s insight emerges when they distinguish science from non-science, whilst denying that there is “any such thing as ‘scientific method’”. For them, this demarcation can be made only through “institutional norms”.26 So the activity of scientists is not to be grounded through adopting a scientific method – such as we find in the work of Karl Popper or Imre Lakatos – but rather through “institutional factors.” These factors are to be justified epistemologically by providing “strong institutional filters on errors”, so generating for them their “normative heuristic” (ETMG 28, 33, 28 & 33) for a given community of inquirers.

Yet they would reject Hegel’s concern for ‘middle sized’ objects: the latter cannot be regarded as providing a “basic source of information about objective reality” which might reveal nature’s objective structures.27 Such information is yielded by “measurements taken from anywhere in the universe” and these provide no grounds for postulating any “self-individuating objects”. What such information can sustain is “a set of mathematically specified structures”, not an ontology presupposed by a traditional understanding of physicalism cast in terms of objects, atoms, particles, or whatever. So there is little point reflecting on the concepts we employ in using language regarding such entities, as Hegel and the followers of the later writings of Wittgenstein presuppose; such analysis simply informs us about how a certain group of philosophers think about reality and subsequently come to categorize experience on the basis of such thinking. So, their sort of activity simply fails to tell us “anything about the deep structure of reality” which contemporary physics informs us actually exist. (ETMG 5, 44 & 16)

25 That insight is expressed by Peirce in the way he focuses on the importance of the community of inquirers, a focus which can be found in his “On the Doctrine of Chances” especially CP 2.654-5.

26 Such as “requirements for rigorous peer review before claims may be deposited in ‘serious’ registers of scientific belief, requirements governing representational rigour with respect to both theoretical claims and accounts of observations and experiments, and so on.” (ETMG 28).

27 As Paul Humphries puts it: “Humans are all inescapably middle-sized objects with limited cognitive capacities that developed in the course of dealing with properties associated with similarly sized objects.” “Scientific Ontology and Speculative Ontology”, Scientific Metaphysics, 51-78, 68.
A Tripartite Taxonomy for the Scientistic Stance

Ladyman and Ross are adamant in sustaining what they call “the scientistic stance”. (ETMG 64) But defining it as the synthesis of empiricism and materialism obfuscates the degree to which any thinker may be scientistic. Nor does Haack’s attempt to define scientism as “an excessive readiness to accept as authoritative any claim made by science”28 shed any further light on the question ‘To what degree is any thinker scientistic?’ But consider Peirce’s Logic of Abduction. The first stage of his “Indagation” (CP 6.568), Peirce’s Logic of Inquiry, focusses upon the starting point of hypothesis generation, Retroduction (CP 1.68), “the spontaneous conjectures of instinctive reason” (CP 6.475), articulating possibilities thrown up by experience. The second stage, Deduction, is cast as making “all sorts of conditional experiential consequences” perfectly distinct as possible. (CP 6.470-1) The Third Stage evaluates this process by taking up the predictions such consequences invoke through testing them: Induction (6.472-4). Three distinct forms of Scientism can be articulated through reifying each of these stages29: Relativistic, Methodological and Dogmatic Scientism.

Ladyman and Ross would not wish to defend a Relativistic sense, the idea of working “with many alternative theories” arising from intuition for their own sake alone where scientific method is cast as but “an ornament” concealing the idea that “‘anything goes’”.30 This is not simply because materialism is defined too inadequately by one at least of its proponents: “Materialism [...] assumes that the only entities existing in the world are atoms, aggregates of atoms and that the only properties and relations are the properties of, and the relations between such aggregates.”31 Nor necessarily would their rejection be because of Feyerabend’s advocacy of a particular kind of empiricism in advocating a critical metaphysics but rather because of suspicion regarding what might be meant by saying that in certain situations “neither ‘facts’ nor abstract ideas can ever be used for defending certain principles come what may.”32 That suspicion would be

grounded in an awareness that Feyerabend defines science iconically or intuitively as any kind of investigation into what might be regarded as the truth. Incidentally, it ought to be pointed out that this Relativistic sense of Scientism might endorse Susan Haack’s first sign of Scientism: “Using the words ‘science’, ‘scientific’, ‘scientifically’, ‘scientist’, etc., honorifically, as generic terms of epistemic praise”. Yet none of the other five signs she identifies with scientism concerning the identification of a demarcation principle delineating the word science, or the way adopting Scientism denies the value of other kinds of inquiry would be included here.

Ladyman and Ross could be regarded as defending a Methodological sense of Scientism: “the attempt to extend the use of the methods of natural science to other academic disciplines”, celebrated in Popper’s writings despite its rejection of Peirce’s Retroduction as merely psychological. True, they reject the idea that there is any such thing as ‘scientific method’, yet the idea that science can be demarcated from non-science is sustained through their claims on behalf of institutional norms. They would sustain the idea that “the meaning of knowledge is defined” by what scientists do provided it is appreciated that their activity meets the requirements of their claims on behalf of “repeated iteration of institutional error filters.” Such an idea of Methodological Scientism may be captured by Peirce’s claim concerning ‘the experimentalist’s mind’: the disposition “to think of everything just as everything is thought of in the laboratory, that is, as a question of experimentation.” but, in terms of what might be considered as a warning to Ladyman and Ross, he adds that no living person “possesses in their fullness all the characteristics” of such a type. (CP 5.411) Consider, for example, what Peirce says about three classes of men elsewhere: the artist, the entrepreneur, and the scientist. (CP 1.43)

The case for Methodological Scientism can be articulated by claiming that it is possible this form of scientism can defend the following Peircian theses:

1) that each stage of Peirce’s Logic of Abduction is crucial in explicating the nature of inquiry;
2) that there are other dimensions to human awareness as well as

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34 Cf. P. Feyerabend, Against Method, pp. 249 & 246.
36 J. Habermas, Knowledge & Human Interests, p. 67.
adopting the turn of mind of the experimentalist, forwarding a valid route to knowledge acquisition;

iii) that fallibilism is to be endorsed. Theories are always provisionally accepted or adopted in the light of their testing, thereby providing a route towards the truth but not necessarily establishing what is true;\footnote{Cf. K. Popper, \textit{Unended Quest} Glasgow: Fontana/Collins 1976, pp. 41-4.}

iv) that such activity is, as Popper once remarked in a different context, “a branch of literature”\footnote{K. Popper, \textit{Objective Knowledge: An Evolutionary Approach} (1972) Oxford: Clarendon Press 1975 p. 185.}: it is through literary or ‘formulated’ inscriptions, akin to a written text, that scientific activity becomes legitimated.\footnote{“No matter if people talk about quasars, gross national products, statistics on anthrax epizootic microbes, DNA or subparticle physics; the only way they can talk and not be undermined by counter-arguments as plausible as their own statements is if; and only if, they can make the things they say they are talking about easily readable. No matter the size, cost, length, and width of the instruments they build, the final end product of all these inscription devices is always a written trace that makes the perceptive judgment of the others \textit{simpler}.” B. Latour, “Give Me A Laboratory & I will raise the World,” \textit{Science Observed}, K.D. Knorr-Cetina & M. Mulkay (eds.), London: Sage Pub., 1983, 141-70, p. 161.}

v) that the methods of science can be used where appropriate within other cognitive disciplines if explanatory virtue is “an important desideratum” determining belief.\footnote{A. Chakravartty, \textit{A Metaphysics for Scientific Realism}, Cambridge UP, 2007, 17.}

We can now see why Stenmarks’s characterization of Epistemic Scientism runs together two quite distinct senses of Scientism: “the view that the only reality that we can know about is the one science has access to.”\footnote{M. Stenmark, \textit{Scientism: Science, Ethics and Religion}, 4.} On the one hand we have Methodological Scientism, the conjecture that the use of scientific methods provides a reliable access to knowledge. On the other hand, we have a much more dogmatic account: the only reality we can cognize is the one to which scientific activity has access and no other.

\textbf{Interpreting Dogmatic Scientism}

Do Ladyman and Ross endorse a \textbf{Dogmatic Scientism} in which an obsession with scientific results dominates, as inquiry has become embod-
ied in techno-science? Let’s analyse their possible response in ascertaining how far any Peircean approach can be sustained, before examining any of its possible shortcomings as far as their stance is concerned. With respect to i), they show no more interest in Retroduction than did Popper. They fail to examine the validity of what Peirce postulated for this stage. True, they do admit, grudgingly that “intuitions in one sense of the term are important to science”, but because they are not really interested in the logic of discovery, they fail to analyse its significance or role in generating hypotheses within scientific activity, restricting the intuition’s role merely to “rare occasion” (ETMG 15 & 28), as in the cases of Darwin and Einstein. Reference is made to “Abductive inferences” but their significance and role is not examined. Even John Worrall, in explicating his Structural Realism, which Ontic Structural Realism develops, points to the instinctive nature of the ‘No Miracles’ argument and to Peirce’s sense of abduction’s importance. And that is for at least three reasons. Firstly, neither Deduction – focussing on the consistency of thought with itself – nor Induction – testing the consistency or otherwise of thought with existence in itself – can even begin without that first creative stage, Retroduction. Secondly, Retroduction is important for what can be called “the Economics of Research”, cashed as a “leading consideration” with respect to “money, time, thought, and energy”, (CP 1.122 & 5.600) Thirdly – emerging from this – is the issue as to how the mind, on some occasions, can hit upon a hypothesis so readily out of so many possible alternatives. To account for this phenomenon, Peirce considered a conjecture forwarded by Galileo, namely that the human mind might exercise Il Lume Naturale: without “a natural bent in accordance with nature” an inquirer would have “no chance of understanding at all.” (CP 6.477)

In their attack, the first two arguments – the origins of scientific creativity and the economy of research – are not addressed. But the third one they try to undermine. They claim that “individual human beings are poorly prepared by evolution to control complex inductive reasoning across domains that did not possess survival problems for our ancestors.” (ETMG


44 Ladyman and Ross fail to note that Peirce came to use the term Abduction to cover the logic underpinning inquiry’s development, using the term Retroduction to “yield qualitative amplification of knowledge.” J. Ladyman & D. Ross, “The World in the Data,” *Scientific Metaphysics*, 108-50, 142.

28) Left like that this claim seems to be an opinion. It can’t be analytic and since the history of science has falsified such a claim — as they admit in the cases of Darwin and Einstein and consider Watson’s claim to have had a vision in relation to the discovery of the DNA molecule’s arrangement\(^\text{46}\) — it might appear to be empirical. But if it is still maintained in the face of evidence then it might be cast as metaphysical\(^\text{47}\) but requiring ad hoc hypothesizing to sustain it! To secure their claim they would have to demonstrate that the claims for Retroduction are not in any way supervenient or even a derivation from Peirce’s conjecture “that nature fecundates the mind of man with ideas which, when these ideas grow up, will resemble their father, Nature.” (CP 5.491) One way this might be done is to argue that unlike the situation in Peirce’s own time, in the contemporary world it is not nature as experienced which must answer our questions,\(^\text{48}\) but rather as ‘experienced’ in that occurrences, recorded for the data nature can yield through instrumentation, is what counts. Yet such a response raises another difficulty as we will see.

The issue regarding other dimensions to human consciousness (ii above) is ignored. Their status requires clarification particularly if one wants to claim that there is only one way ahead to truth. Poetry seems disparaged in ETMG. To make the point sharper, consider the poets heavily influenced by Schelling’s philosophy, Wordsworth and Shelley whom Whitehead cites in ‘The Romantic Reaction’ in his Science and the Modern World.\(^\text{49}\) Now how are we to regard the writings of these two poets as they reacted against the nineteenth’s century’s materialist philosophy? Are they merely “the ‘objective’ expression of merely ‘subjective pathology’?”\(^\text{50}\) Or do these poets provide insights into the way natural entities are organically interrelated as well as a sense of endurance temporally embodied within them?

One might get away with saying, for example, that one is not concerned with such an aesthetic perspective, with the way, for example, a


\(^{48}\) Physicists must “constrain nature to give answer to questions of reason’s own determining” rather than kept, as it were, in “nature’s leading-strings.” N. Kemp-Smith, Immanuel Kant’s Critique of Pure Reason, London: MacMillan & Co. Ltd., 1929, B xiii.


\(^{50}\) T. Bewes, Reification or the Anxiety of Late Capitalism London: Verso, 2002, 98.
A block of marble might be related to how it is seen as a superb piece of sculpture. But one can hardly sustain such a claim with regard to ethical claims. ETMG is littered with normative demands. Now how are these to be justified; through the use of some kind of transcendental precepts, as employed by the older Peirce and later by Karl-Otto Apel, or through Peirce’s earlier ‘Decisionism’?

Ladyman & Ross seem to sustain Peirce’s Fallibilism (iii above). Yet at any time – according to his doctrine of Credibilism – there must be propositions that are held free from doubt (CP 5.376) if we are to employ Peirce’s doctrine. Nonetheless these temporally doubt-free propositions can still be made subject to doubt on some other occasion. Given this, then “we can never be absolutely sure of anything” since our knowledge “[...] always swims, as it were, in a continuum of uncertainty and indeterminacy”, (CP 1.147 & 1.171). Moreover the history of human cognitive achievement has led to the distinguishing of different forms of knowledge, so it seems strange to claim that the only access to reality is through what can be “derived from the details of scientific research” (ETMG 65) alone. If that is the position they are articulating, how is such a claim to be justified? This claim can’t be analytic, certainly not empirical either since it plays a decisive role in determining what is to count empirically. Hence it must be metaphysical in character and is in need of a defence.

Let us turn to the legitimation question (iv above). Here we run into a logical objection. In the case of Naturalistic Fallacy, value claims are seen as justified through the facts. Normative Fallacy reverses this Fallacy:51 assertions about what is the case are thought to follow from beliefs about what ought to be so. A story about the importance of institutional procedures (ETMG 28) maybe true as a narrative about how science ought to proceed, but it is a factual matter as to whether it accounts for what actually happens within scientific activity itself, as expressed in the work of such thinkers as Bruno Latour.52 Ladyman and Ross’s claims on behalf of the Institutional justification for distinguishing science from non-science

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51 T.D. Campbell, “The Normative Fallacy,” *The Philos. Quart.* 20, no.81 (Oct. 1970), 368-77. With respect to the recent furore regarding British spies in January 2014, the British foreign minister William Hague reiterated his claim that the UK has the world’s strongest system of regulation and that agencies do not breach it because we live in the UK not the USA. *The Guardian*’s editor in chief along with Tory MP David Davis claimed that this claim was “laughable”. What Hague could only mean was that the state of affairs he described *ought* to be so! (cf. *The Guardian*, Sat. 18th. Jan 2014, 4).

concerns how scientific activity ought to proceed rather than how it does so. If this Fallacy is committed, an anti-empirical stance is being adopted, since this particular stance obfuscates the examination of the facts about the practice of science itself!

Finally what are we to make of Ladyman and Ross’s claims in regard to the use and role of science in relation to other cognitive disciplines (v above)? For them, the methods given price of place are those that belong to physics which enjoys “a special status.” As a result, any hypothesis considered to be in “conflict with fundamental physics, or such consensus as there is in fundamental physics, should be rejected for that reason alone. Fundamental physical hypotheses are not symmetrically hostage to the conclusions of the special sciences.” This principle is the “Primacy of Physics Constraint”, so that we have physics on the one hand, and special sciences on the other. Whereas the latter use the ideas of causality and self-subsistent individuals, physics does not. Putting mathematics on one side, cited as special sciences are biology, chemistry, economics, psychology, and cognitive science as behavioural forms of inquiry along with some aspect of anthropology and ethology. Added to these sciences are those parts of physics that are not what can be regarded as fundamental, such as, say, acoustics. (ETMG 44, 239 & 95) So a special science can be defined as one if it “aims at generalisations such that measurements taken only from restricted areas of the universe, and/or at restricted scales are potential sources of confirmation and/or falsification of those generalizations.” Note that emphasis upon measurement which will lead to the acquisition of information. Hence the transformation, later, from the idea of Ontic Structural Realism to Information-Theoretic Structural Realism. (ETMG 195 & 238)

All these sciences can be regarded as those that Habermas lists as being concerned with a knowledge-constitutive interest in possible technical control requiring “the objectification of reality necessary” to render what he calls “the transcendental framework of processes of inquiry possible” securing and expanding through information and feedback-monitored action, the eventual control of nature, so that what can be demonstrated in the laboratory can be extended and be applied into our everyday world. Those forms of knowledge that are focussed upon interpretative awareness between persons to ensure some kind of mutual understandings in relation to the conduct of life are ignored – or referred to if they make use of scientific techniques – unless they can be cast into behavioural terms.54 As

53 J. Habermas, Knowledge and Human Interests, p. 135.

54 So B.F. Skinner’s contribution to the scientism debate is quoted with approval. (ETMG 12).
for that emancipatory cognitive interest which might make self-reflective knowledge possible, where inquiry is pursued for the sake of enlightenment, making an interest in autonomy and responsibility possible and where philosophical activity enjoys its home, the only function for philosophy would appear to be a concern for practical metaphysics. Such a metaphysical enterprise would be inspired by the motivation to satisfy the requirement of unifying “the special sciences with physics”. (ETMG 194) Everything else is dismissed along with Heideggerian philosophy as “philosophical anthropology”. (ETMG 5) We have discovered herein, then, that not just the methods of the sciences might be used in other modes of inquiry, say in history about the life of Napoleon, but rather something about the status of what counts as a genuine form of epistemology for Ladyman and Ross.

Conclusion

In *Every Thing Must Go*, Ladyman and Ross seek to establish a metaphysics grounded solely on contemporary science, to provide the basis for objective knowledge. Their conception of OSR, in constructing such a metaphysics thereby, is compatible with what they regard as current fundamental physics and can be related to metaphysical claims emerging from the empirical sciences. This stance constitutes their ‘Rainforest Realism’ since it offers a more generous ontology than that generated by a reductionist epistemology by combining the roles of information theory and sophisticated systems theory to meet the demand for such compatibility. But the idea of the scale through which natural occurrences are measurable relativizes claims as to what actually, in a mind-independent way, exists.

After considering their stance with respect to macro and their ‘middle-sized’ objects, their endorsement of scientism was explored. A relativistic sense of scientism was dismissed as being too vague before five postulates characterizing a methodological version were considered. None of these were fully accepted by them because they adopt a more dogmatic form of scientism. That dogmatism emerges in the way science is perceived through the eye-glasses that the results of science provide. Consider their attitude in regarding other forms of inquiry as irrelevant outside the measurable, and the dogmatic assumption that “no hypothesis that the approximately consensual current scientific picture declares to be beyond our capacity to investigate should be taken seriously.” Now what is the status of that claim? It isn’t analytic or empirical. So it must be metaphysical in

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principle, rather than in practice, since for them it is part and parcel of their naturalistic constraint upon claims issuing in their Principle of Naturalistic Closure (PNC). (ETMG 29 & 37)

Such obfuscation is well illustrated by their assumption, namely, “that there is no fundamental level; that the real pattern of reality is the last word in ontology.” They then claim that it “is open to empirical falsification”. (ETMG 178) But if that were so, it couldn’t be metaphysical in character. It might be a claim which could be undermined over some time period, making it thereby metaphysical in practice.56 Again what is the status of the ‘no miracles argument’? Consider, for example, the general theory of relativity. It would be a gigantic coincidence or indeed a miracle if its claims about the universe’s fundamental structure were not correct, given that it generates so much in the way of accurate empirical predictions. Indeed, if the success of science is not to be regarded as a miracle, then we have the valid claim that through using scientific knowledge, data patterns can be projected in furthering that knowledge.57 Now, in recognizing that ‘the no-miracles argument’ might be undermined (ETMG p. 84) rather than falsified, Ladyman and Ross recognize implicitly that it has a different status from making empirical claims, that it to say, that it is metaphysical in character since without it the case for claiming realism for scientific theorizing would be undone. In other words, one could be a Structural Realist without being an Ontic Structural Realist – as John Worrall and Elie Zahar might claim – but, nonetheless, sustain the no-miracles argument: the no-miracles argument has, thereby, a different status for Ladyman and Ross’s Ontic Structural Realism, because they require the former to sustain the latter.

Earlier the idea of experiencing through instrumentation – ‘experiencing’ – was distinguished from experiencing first hand in a veridical way. Peirce could see that with the development of instrumentation, the former would come to supplant the latter. Whereas the latter sustains the distinction between nature and culture,58 ‘experiencing’ collapses that distinction. So Realism would be sustained by the idea that scientific methods which invoke instrumental techniques, to get nature to answer our questions, are in fact reliable. Without adopting that claim as true, scientific activity would be im-

56 The idea of Black Holes served as a metaphysical claim practically in the 1960s but despite Sir Fred Hoyle’s rejection of their possible existence, eventually they were recognized as existing as empirically confirmed.


possible. Such a claim cannot be a general fact, (ETMG 70) even if treated as such, since it cannot be falsified by science because that claim makes scientific activity itself possible. Again it can only be regarded as metaphysical in principle in order to underpin scientific activity itself.

These considerations are made in regard to the failure of Ladymon and Ross to distinguish adequately between factual statements, statements that are metaphysical in practice, those that are metaphysical in principle – such non-restrictive, necessarily existential truths such as ‘Necessarily, something exists’ or ‘Necessarily, experience occurs’59 – and the relationship of all these to “metametaphysics”. Such distinctions are crucial if one wants to distinguish ‘strong’ from ‘weak’ metaphysical claims. This failure implies that the adamant claims made in their book – and referred to in this paper – generate a dogmatic form of scientism. And their advocacy of adopting a ‘stance’ in regard to “a sound philosophical position” (ETMG 65) seems undone by the way they hold to such claims.

In addition, they seem committed to “living out” a life based on such a scientistic stance. (ETMG 65) Two options face them. One is a Janus-faced Dogmatic Scientism. A private existentialism might work hand in glove with a public tolerance of a behaviouristic account of other peoples’ responses regarded as spatio-temporal events, a behaviouristic view of other people, whilst one’s own first person evaluations would be granted validity. In this way Ladyman and Ross would live lives cast as existential behaviourists.60 On the other hand, an Essentialistic Dogmatic Scientism might be defended: “the fundamentalist belief that science can do no wrong and will ultimately answer any question worth answering while in the process saving humankind as a bonus.”61 But can such “promissory notes for discoveries, not yet made”62 be delivered? In addition can such

59 Cf. C. Hartshorne “Non-restrictive Existential Statements”, p 47.
a life – dismissing the role and significance of private experience – be enjoyed according to such a stance? Answering that question would require, of course, a further paper.\textsuperscript{63}

\textbf{ABSTRACT}

Ladyman and Ross’s \textit{Every Thing Must Go} is a challenging text. In order to ascertain its significance, attention will be focused on their idea of Scale Relative Ontology. To do this their conception of Ontic Structural Realism will require elucidation. Its implications for Scale Relative Ontology will be explored before considering the way Scale Relative Ontology can be cast through three possible dimensions: the cosmological, the ordinary middle-sized, and scientific perspectives. In exploring the latter perspective, and applying insights derived from Peirce’s philosophy, their defence of Scientism will then be considered. In this way three different senses can be distinguished through which this doctrine can be presented, before examining what kind of Scientism they advocate and thereby its adequacy.

\textbf{Key-Words:} Scale – Relative – Ontology – Scientism – Structural

\textbf{ZUSAMMENFASSUNG}

‘Everything Must Go’ (Alles muss erlaubt sein) von Ladyman und Ross ist ein anspruchsvoller Text. Um seine Bedeutsamkeit festzustellen, soll sich auf ihre Idee der maßstabsrelativen Ontologie (Scale Relative Ontology) konzentriert werden. Dafür ist es nötig, ihr Konzept des ontischen Strukturrealismus (Ontic Structural Realism) zu erläutern. Dessen Implikationen für die maßstabsrelativen Ontologie werden untersucht, bevor überlegt wird, wie maßstabsrelative Ontologie in drei möglichen Dimensionen ausgedrückt werden kann: die kosmologische, die gewöhnlich mittelgroße, und die wissenschaftliche Perspektive. Indem die letztere Perspektive erläutert wird und Erkenntnissen Peirces Philosophie darauf angewendet werden, kann dann ihre Verteidigung des Szientismus geprüft werden. So wird zwischen drei unterschiedlichen Weisen in denen ihre Doktrin präsentiert werden kann unterschieden, bevor die Art des Szientismus, die sie vertreten, und dessen Angemessenheit, untersucht wird.

\textbf{Schlagworte:} Maßstab – Relativ – Ontologie – Szientismus – Strukturell